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Each Side of the True Pelvis, Having
no Connection with the Tumors.*

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A CASE OF DERMOID TUMOR OF BOTH OVARIES COMPLICATED BY A DEPOSIT OF BONE UPON EACH SIDE OF THE TRUE PELVIS, HAVING NO CONNECTION WITH THE TUMORS.¹

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AND

JOSEPH P. TUNIS, M.D.

ALTHOUGH the presence of calcareous matter in and around the ovary has been frequently demonstrated by abdominal surgeons of large experience, a careful examination of the masses removed has almost invariably proved that they were examples of simple calcification, and not of true ossification as had been supposed. Macroscopically, it is impossible to make a positive diagnosis. These calcareous masses resemble very closely irregular lumps of bone. They may be irregularly nodular in outline, of such a firm structure as to require the use of a saw before they can be divided, and yet on cross-section they present no regularity of structure, but are, as a rule, made up of a homogeneous deposit of lime salts, more or less firmly held together by a fibrous stroma. In the great majority of cases when these masses have been examined under the microscope no evidence of true bone has been found. When, therefore, unmistakable evidence of commencing ossification was demonstrated under the microscope in the specimen removed from the patient about to be described, the case was deemed of sufficient interest to report in detail. Some features of this case are unique. The history is as follows:

Mrs. T., aged twenty-four years, has always been sterile. Her menstruation began at the age of fourteen. It was never regular, and lasted from one-half to two days. She has always had severe pain before and after the menstrual periods. Her general health has been fairly good, and when she came under observation she was well nourished. She complained especially of abdominal and pelvic pain of very marked character, which was becoming rapidly worse, so as to prevent her from performing her accustomed duties. She complained also of leucorrhœa; and of the presence of a tumor in the abdomen, which she first noticed eighteen months ago. Upon examination, the outlines of a cystic tumor could be readily felt filling the pelvis and extending as high as the umbilicus. From the history and the physical condition present a diagnosis of ovarian tumor was made, the inference being that it was of a dermoid

¹ Read before the College of Physicians, Philadelphia, October 2, 1895.



character. An ovariectomy was performed after the usual methods, in the Kensington Hospital for Women, September 8, 1893.

After making the abdominal incision, the left index and middle fingers were introduced to explore the tumor and pelvis. The middle finger of the exploring hand immediately came in contact with something sharp enough and firm enough to divide the skin of that digit. It was then recognized on further examination that a considerable mass of bone was present near the level of the brim of the pelvis and in the region of the right sacro-iliac joint. It was a spicule from this mass of bone that had inflicted the cut on the exploring finger. The mass had no direct connection with the tumor of the right ovary, which was peeled out of its bed of adhesions and removed. A small tumor of the left ovary was then removed. Subsequent examination of these tumor masses showed them to be of a dermoid character. The larger one was about the size of a child's head at term, the smaller about as big as a good-sized walnut. The mass of bone from the right side of the pelvis was then enucleated from its connective-tissue bed, lying for the most part along the psoas muscle. It was irregular, nodular in outline, somewhat quadrilateral in shape, and presented one or two sharp spicula on its surface. (See Fig. 1.) It measured an inch and a half by

FIG. 1.



Irregular mass of calcareous matter and bone removed from the right psoas muscle.
Sharp spiculum on lower margin.

an inch and three-eighths in its greatest extent, and was three-quarters of an inch thick in its greatest width. A smaller mass was felt in the left side of the pelvis at a somewhat lower plane than that upon the right side and lying between the rectum and the left pelvic wall. This specimen was also removed (see Fig. 2), and presented very much the appearance of the first specimen, although not quite as large.

The bed from which the specimens were removed presented a number of spicules of bone protruding through the tissues in the neighborhood of the region from which the specimens were enucleated. The mass removed from the right side had been in close relation with the psoas muscle, that on the left side was situated much more deeply and was in relation with the tissues of the great sacro-sciatic notch. It was not deemed advisable to attempt the removal of any additional spicules of bone, as they did not seem likely to inconvenience the patient in any way and were not sufficiently detached to be as readily removed as had the

masses represented in the accompanying illustrations. As a subsequent microscopic examination led to the discovery of true bone in the masses removed the case at once becomes one of peculiar interest.

FIG. 2.



Smaller nodular mass removed from the left side of the pelvis.

After the pelvic cavity had been thoroughly irrigated and a drainage-tube introduced, the usual antiseptic dressing was applied, and Mrs. T. made an uninterrupted recovery. A short time after the operation she reported herself as feeling very well, and that she had never been better in her life. It is now two years since the operation. She has gained considerably in weight and is free from pelvic pain.

FIG. 3.



Photo-micrograph of a decalcified section of one of the masses, showing a portion of true bone characterized by numerous lacunæ. Magnified 30 diameters.

Microscopical examination of the masses removed from the brim of the pelvis. After decalcifying a portion of one of the specimens in a solution of nitric and chromic acids¹ for two weeks, the specimen was

¹ Decalcifying solution (Rutherford):

Chromic acid	1	gram.
Water	200	c.c.
Then add 2 c.c. nitric acid.		

mounted in paraffine after the usual method and sections made with great difficulty. Under the microscope the greater part of the section was seen to consist of a fibrous stroma still containing a few calcareous salts, the greater quantity of which had been removed by prolonged soaking in the acid solution, leaving frequent air-spaces through the section. At a number of points, however, true ossification was demonstrable, as can be seen in the accompanying illustration taken from a low-power (30 diameters) photo-micrograph of the specimens. At these points the irregular fibrous stroma is lost, and there is a firmer, clearer matrix containing numerous lacunæ.

Aside from the pathological questions involved in the nature of the specimens removed, the most interesting question in connection with the case is in regard to the origin of these bony formations, as well as the probable increase in size of the spicula of bone which are now present in the pelvic tissues of this patient. It seemed probable at first, when dealing with the right side, that this mass of bone had originally developed in the dermoid tumor, had ulcerated its way through the sac of the tumor, and in that way become independent of and separate from the original growth, but when in examining the left side, the second specimen (Fig. 2) was found so widely removed from the tumor it became a matter of extreme improbability that both of these masses could have ulcerated their way through the dermoid tissues and become attached separately to each side of the pelvis. It would certainly be an unheard-of event for a piece of bone to exist in two dermoid tumors in the same woman, and for each of them to set up an ulcerative process and escape from the tumor; the masses of bone becoming attached in a new position, without the development of general peritonitis or some form of pelvic suppuration. It must, therefore, be concluded that this bone-formation took place independently of the growth of the tumors.

As there are still existing numerous spicules of bone in this woman's pelvis to act as a nidus for further development, the subsequent course of this woman's case will be a matter of interest, especially in regard to her pelvic soft parts. It is not likely that the entire pelvic region will become ossified, although such a condition is possible. If such a condition should result, which seems extremely unlikely, the case would then assume some of the features of progressive muscular ossification. This pathological condition (*myositis ossificans multiplex* or *progressiva*) is characterized by a stiffness, commencing in the extremities and becoming progressively worse, so that locomotion soon becomes impossible. It begins in one or more of the *joints* and rapidly extends. Little or no pain is experienced, and the lesions are readily demonstrated on inspection. This condition sometimes follows a slight trauma, but may occur without any such cause. It occurs in the muscles, intermuscular connective tissue, fasciæ, tendons, or periosteum. Eichhorst¹ describes

¹ Hermann Eichhorst: *Handbuch der speciellen Pathologie und Therapie*, Band III, s. 600.

a form of progressive bone-formation which occurs most frequently in males from eight months to fifteen years of age. The first changes occur in the muscles of the neck and back, then in those of the shoulder and arm; subsequently the lower extremities are affected. Sometimes the jaw-muscles and certain muscles of the face are also affected. Such a condition is very readily differentiated from the case in point by the fact that the pathological process attacks the muscles progressively and the lesions are multiple in character.

In an excellent article on "Calcified Tumors of the Ovary," Dr. J. Whitridge Williams,¹ of Baltimore, writes: "Within the past year several gentlemen have sent us solid tumors of the ovaries which they supposed were of osseous nature, but on careful microscopical examination we found that they were not composed of bone, but were due to the calcification of ovarian structure, with which we are all familiar. True, osseous tumors may also occur in the ovary, but they are even more rare than calcified tumors, and it is far more difficult to give a satisfactory explanation for their occurrence than for the calcific changes in fibromata. And it must also be remembered that osseous formations occur but rarely in any portion of the body, while calcification occurs very frequently in many organs. Osseous formations of this character can only be explained by Cohnheim's tumor hypothesis." After a careful search through the literature of this subject, the writer says: "The only cases of osseous formations in the ovary are those mentioned by Fürst,² Reiss,³ Waldeyer,⁴ and Winckel."⁵ And even these cases are open to dispute, as a microscopic examination was not made in every case. Solid tumors of the ovary are rare. Greig Smith says: "Of all tumors of the ovary, probably not more than 3 per cent are solid." (*Abdominal Surg.*, Amer. ed., p. 155.) Of 282 consecutive ovariectomies reported by Homans only three were for solid tumors of the ovary. Of 207 unselected ovariectomies collected from various operators by the *Pittsburg Medical Review* only seven were for growths of this variety. (Pittsburg, 1888.) Of 101 consecutive ovariectomies reported by Tait only two were for solid tumors. (*Diseases of the Ovaries*, American ed., 1853, p. 319.)

A philosophical explanation of the presence of these bony masses in the pelvis of this woman would be to regard them as an incomplete foetal inclusion and to class the case among the "Endocyma" group

¹ Williams (J. W.): Calcified Tumors of the Ovary. Trans. Amer. Gynecolog. Soc., vol. xviii., 1893, pp. 359-376.

² Fürst: Knochenneubildung in der Wand einer Ovariencyste. Virchow's Arch., 1884, xvii. 131.

³ Reiss: Ueber Enchondroma Ovarii. Diss. Ing. Berlin, 1882.

⁴ Waldeyer: Diffuses Eierstocksfibrom von eigenthümlichen Baue. Archiv f. Gyn., 1871, ii. 440.

⁵ Winckel: Frauenkrankheiten, 2. Auf. 1890, 640.

of human monstrosities.¹ By this term is meant the more or less complete inclusion of a parasitic fœtus within the body of the autosite. In the large cavities of the body—the abdominal, thoracic, and cranial—the presence of a parasitic embryo is explained by true inclusion, the arching-over process of the walls in the autosite enveloping the parasite within them. In abdominal inclusion (fœtus in fœtu) the parasitic fœtus may be fairly well formed, but never reaches full development. On the other hand, it may be a mass no bigger than one's fist—of lowest development.²

In this connection it is interesting to recall the case reported by Dr. J. L. Atlee of congenital ventral gestation in a girl of six years, who lived seventeen years after the discharge of the mass from her abdomen. The full particulars of this case are detailed in the *Transactions of the College of Physicians of Philadelphia*, 1879, 3d ed., iv., 231–248. While the occurrence of these osseous tumors may thus be explained by a process originating in an early part of the embryonal life of the individual, their presence is more readily accounted for as a result of a pathological change in the psoas muscles. While one of the masses removed (as may be seen by reference to Fig. 1) resembled in outline an imperfect vertebra, it is difficult to imagine that another vertebral column included within the abdominal cavity of the patient should have undergone complete division and passed down into the pelvis in the substance of either psoas muscle. The spicules of bone presented equally on both sides of the pelvis.

¹ Hirst and Piersol: Human Monstrosities, part iv. p. 199. Lea Bros. & Co., Phila., 1893.

² Ahlfeld (F.): Die Missbildungen des Menschen. Leipzig, 1880. Text-book and atlas.

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